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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/796,527	03/09/2004	Takao Mori	112857-478	1944

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EXAMINER	
BERNARD, VIJI	

ART UNIT	PAPER NUMBER
1792	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/796,527	MORI ET AL.	
	Examiner	Art Unit	
	Viji N. Bernard	~~1763~~ 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11,14-16 and 18-24* is/are pending in the application.

4a) Of the above claim(s) *24* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11,14-16 and 18-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/02/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/02/2007 has been entered.

Election/Restrictions

Newly submitted claim 24 directed to an invention that is independent or distinct from the invention originally claimed.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 24 withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 11, 14, 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S Patent. No: 5,695,564 to Imahashi in view of JP 10-214682 to Tanamura et al and further in view of U.S Patent. No: 4,492,180 to Martin.

Regarding Claim 11, 20-23, Referring to (Fig. 1, 2, 8, 9, 10) Imahashi teaches that an apparatus manufacturing an organic electroluminescence display (LCD substrate), the organic electroluminescence display having a substrate, a first electrode layer formed on the substrate, an organic layer including a plurality of organic material layers stacked on the first electrode layer in a predetermined pattern and a second electrode layer formed on the organic layer (Col. 1, Line 11-14 teach that semiconductor wafer and LCD substrates, are repeatedly subjected to a plurality of processing steps such as film formation steps, so there may be different layers of film formation over the substrate), the apparartus comprising: a first alignment mechanism (Fig. 8, U3a, interconnection unit, Col.7, Line 2-9 teach that each of the interconnection units U3 and U7 not only functions to temporarily store the wafers W between the two transfer units U2, but can function to perform a test, temperature regulation, heat treatment, alignment, etc., so the alignment may be aligning, attaching or separating the mask and the substrate or aligning the

substrate or positioning the substrate. It is to perform designated function) for aligning a mask, having openings corresponding to the predetermined pattern, to the substrate and for detachably attaching the mask and the substrate; a first formation unit (U1a, large process unit, U2a, transfer unit, U3a, interconnection unit/alignment unit, U4a, in/out unit, U5 in Fig.2, small processing unit are all called first formation unit) including a plurality of vacuum processing chambers (U2a, U3a, U4a, U5) for sequentially forming the plurality of organic material layers on the substrate at a first color position, the substrate being attached to the mask; and a second alignment mechanism (U3b) for changing the alignment between the substrate and the mask, and for detachably attaching the substrate and the mask again; and a second formation unit (U1b, large process unit, U2b, transfer unit, U3b, interconnection unit/alignment unit, U4b, in/out unit, U5 in Fig.2, small processing unit are all called second formation unit) including a plurality of vacuum processing chambers for sequentially forming the plurality of organic material layers on the substrate at a second color position, the substrate being attached to the mask, wherein each of the vacuum processing chambers correspond to each of the organic material layers, and wherein the second alignment mechanism (U3b) is provided to connect the first formation unit (U1a) and the second formation unit (U1b) in series thereby providing flow-through processing, and is configured to perform the alignment changes in a vacuum atmosphere and a loading unit (U4a, in/out units) including a plurality of processing chambers, the plurality of processing chambers including the first alignment chamber (U3a), wherein the loading unit (U4, U8) is connected in series with the first formation unit (U1a) by a transfer chamber (U2a, U2b, U2c, U2d, transfer units), thereby providing flow-through processing and a third formation unit (U1c) including a plurality of vacuum processing chambers for sequentially forming the organic material layers on

the substrate at a third color position, the substrate being attached to the mask; and a third alignment chamber (U3c) connecting the second formation unit (U1b) to the third formation unit (U1c); wherein the first formation unit (U1a), the second alignment chamber (U3b), the second formation unit (U1b), the third alignment chamber (U3c), and the third formation unit (U1c) are connected in series (Fig. 8) (a multi chamber processing system includes plurality of process chambers (film formation unit (large processing units), small processing units, transfer units loading/unloading (U4, U8, in/out unit) and alignment chambers) are connected in series (Fig. 1, 2, 8, 9, 10) (U1 (U1a, U1b, U1c, U1d), U5, process units/1st, 2^{nd}, 3^{rd}, 4^{th} film formation units, U2 (U2a, U2b, U2c, U2d), U6, transfer units, U3 (U3a, U3b, U3c), U7, a linear interconnection unit/1^{st}, 2^{nd}, 3^{rd} alignment unit, U4 (U4a, U4b), U8, wafer storing in/out units or 1^{st}, 2^{nd} loading/unloading units) (Col. 1, Line 10-15, Col. 2, Line 24-27, Line 40-41, Line 60-67, Col. 3, Line 20-30, Line 55-60, Col. 4, Line 55-67, Col. 5, Line 1-10, Line 63-67, Col. 6, Line 1-67, Col. 7, Line 1-9, Col. 9, Line 36-59)).

Second alignment mechanism, Second formation unit, Third alignment mechanism, Third formation unit are directed to duplication of parts.

The mere duplication of parts has no patentable significance unless a new and unexpected result is produced. In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960).

Imahashi does not expressly teach that an apparatus manufacturing an organic electroluminescence display, the organic electroluminescence display having a substrate, a first electrode layer formed on the substrate, an organic layer including a plurality of organic material layers stacked on the first electrode layer in a predetermined pattern and a second electrode layer formed on the organic layer and the first and second formation units include a plurality of

vacuum processing chambers for forming a hole injection layer, a hole transfer layer, and a light emitting layer on the substrate at a first color position and each of the hole injection layer, the hole transfer layer, and the light emitting layer is provided with a predetermined thickness corresponding to an emitting color.

However, Referring to (Drawing 1-5), Tanamura et al teach that manufacturing an organic electroluminescence display, the organic electroluminescence display having a substrate (1), a first electrode layer (2, anode layer) formed on the substrate (1, an organic layer including a plurality of organic material layers (3a-c) (Page 4, Paragraph 0023) stacked on the first electrode layer in a predetermined pattern and a second electrode layer (4, cathode layer) formed on the organic layer (3c), the apparartus comprising: a first alignment mechanism (In the transfer chamber, Tanamura et al discloses a procedure mechanism for aligning/installing the mask and the substrate, Page 9, Paragraph 0071) for aligning a mask, having openings corresponding to the predetermined pattern, to the substrate (1) and for detachably attaching the mask and the substrate (Drawing (4)); Tanamura et al teach a first formation unit (22-26, operating vacuum chambers have linear arrangement, but not cluster) including a plurality of vacuum processing chambers (22-26) for sequentially forming the organic material layers on the substrate at a first color position, the substrate being attached to the mask. Further, Tanamura discloses installing/reinstalling/aligning/realigning the substrate on the metal mask, but the alignment chamber is not shown in the diagram. And each of the vacuum processing chambers correspond to each of the organic material layers (Page 9-11, Paragraph 0070-0080). A second and third formation units are also not shown but if you have one set of film formation unit (includes process chambers, alignment chambers, transfer chambers, load lock/unload lock chambers

etc.,), it is possible to connect many units in series. It is just mere duplication of parts.

Second alignment mechanism, Second formation unit, Third alignment mechanism, Third formation unit are directed to duplication of parts.

The mere duplication of parts has no patentable significance unless a new and unexpected result is produced. In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960).

Further, Tanamura et al teach that the first and second formation units include a plurality of vacuum processing chambers for forming a hole injection layer, a hole transfer layer, and a light emitting layer on the substrate at a first color position and each of the hole injection layer (3c), the hole transfer layer (3a), and the light emitting layer (3, organic luminous layer in Drawing 2) is provided with a predetermined thickness corresponding to an emitting color (Page 9-10, Paragraph 0071-0075) for the purpose of preventing respective layer-shaped deposits from contacting with moisture and oxygen in the atmosphere, and inexpensively manufacture an organic electroluminescence element excellent in a light emitting service (Abstract).

Thus, it would have been obvious to one of ordinary skill in the art at the time applicant's claimed invention was made to have provided the first and second formation units include a plurality of vacuum processing chambers for forming a hole injection layer, a hole transfer layer, and a light emitting layer on the substrate at a first color position and each of the hole injection layer, the hole transfer layer, and the light emitting layer is provided with a predetermined thickness corresponding to an emitting color in Imahashi in order to preventing respective layer-shaped deposits from contacting with moisture and oxygen in the atmosphere, and inexpensively manufacture an organic electroluminescence element excellent in a light emitting service as taught by Tanamura et al.

Further, Imahashi doesnot expressly teach a first alignment mechanism for aligning a

mask, having openings corresponding to the predetermined patter, to the substrate and for detachably attaching the mask and the substrate.

However, Matin teach that a first alignment mechanism for aligning a mask, having openings corresponding to the predetermined pattern, to the substrate and for detachably attaching the mask (30, 32) and the substrate (64) for the purpose of indexing and accurate registering the substrate to the deposition mask and minimizing the effects of contraction, expansion and warpage of the mask and the substrate (Abstract, Col.4, Line 30-35, Col. 7, Line 56-68, Col. 8, Line 1-67, Col. 9, Line 1-3) (Fig. 1-10).

Thus, it would have been obvious to one of ordinary skill in the art at the time applicant's claimed invention was made to have provided a first alignment mechanism for aligning a mask, having openings corresponding to the predetermined patter, to the substrate and for detachably attaching the mask and the substrate in Imahashi in order to index and accurate registering the substrate to the deposition mask and minimizing the effects of contraction, expansion and warpage of the mask as taught by Martin.

Regarding Claim 14, Referring to (Fig. 1, 2, 8, 9, 10) Imahashi teaches a vacuum transfer chamber (U3 (U3a, U3b, U3c) connecting the vacuum processing chambers U1 (U1a, U1b, U1c, U1d), U5, process units), wherein the transferring mechanism (12) (Robot) is arranged in the vacuum transfer chamber.

Claims 15, 16, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S Patent. No: 5,695,564 to Imahashi in view of JP 10-214682 to Tanamura et al as applied to claims 11, 14, 20-23, above, and in view of U.S Pub. No: 2001/0006827 A1 to Yamazaki et al.

Regarding Claims 15-16, Imahashi, Tanamura et al and Martin teach that the apparatus of the invention substantially as claimed.

But Imahashi, Tanamura et al and Martin fail to teach that an attachment fixture for attaching the substrate and the mask and the mask is formed of a magnetic material, and the attachment fixture is provided with a contact surface fully contacting a non-film formation surface side of the substrate, has at least the contact surface formed of a plate-shaped magnet, and has the substrate sandwiched between the mask and the contact surface attached with the mask by a magnetic force of the magnet.

However, Yamazaki et al teach that an attachment fixture for attaching the substrate and the mask and the mask is formed of a magnetic material (Page 2,3, Paragraph 0035 teach that an electromagnetic alignment mechanism comprises a mask support member (207) (Fig 2A, 2B), a substrate support member (204), an attachment fixture support member (electromagnetic field) and a movement mechanism (205a - conveyor rail) for the purpose of aligning a substrate and mask without warping and the mask is formed of a magnetic material, and the attachment fixture is provided with a contact surface fully contacting a non-film formation surface side of the substrate (see Fig.2B), has at least the contact surface formed of a plate-shaped magnet, and has the substrate sandwiched between the mask and the contact surface attached with the mask by a magnetic force of the magnet (an electromagnet (210) (Fig 2B) is disposed over the substrate and the substrate is set in a substrate holder (204) and shadow mask (208) is made of metallic material and is fixed to a mask holder (207) for the purpose of forming a magnetic field by the electromagnet, and the shadow mask is drawn to the substrate so as to maintain a predetermined gap (Page 2, Paragraph 0034)).

Thus, it would have been obvious to one of ordinary skill in the art at the time applicant's claimed invention was made to have provided an attachment fixture for attaching the substrate and the mask and the mask is formed of a magnetic material in Imahashi, Tanamura et al and Martin in order to align a substrate and mask without warping as taught by Yamazaki et al.

Again, it would have been obvious to one of ordinary skill in the art at the time applicant's claimed invention was made to have provided the mask is formed of a magnetic

material, and the attachment fixture is provided with a contact surface fully contacting a non-film formation surface side of the substrate, has at least the contact surface formed of a plate-shaped magnet, and has the substrate sandwiched between the mask and the contact surface attached with the mask by a magnetic force of the magnet in Imahashi, Tanamura et al and Martin in order to form a magnetic field by the electromagnet, and the shadow mask is drawn to the substrate so as to maintain a predetermined gap as taught by Yamazaki et al.

Regarding Claim 18, the alignment mechanism provided in Yamazaki et al as described above can be used as alignment or separating mechanism. Also, it can be placed in any transfer chamber including a transfer chamber connected to a vacuum processing chamber for depositing an anode or cathode.

Yamazaki et al and Tanamura et al teach that providing a vacuum chamber connected to a transfer chamber for depositing anode and cathode layer, Yamazaki teaches without a mask (Page 4, Paragraph 0051).

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S Patent. No: 5,695,564 to Imahashi in view of JP 10-214682 to Tanamura et al as applied to claims 11, 14, 20-23, above, and in view of U.S Pub. No: 2001/0006827 A1 to Yamazaki et al and in view of U.S Patent. No: 6,214,631 B1 to Burrows et al.

Regarding Claim 19, Imahashi, Tanamura et al and Martin teach that the apparatus of the invention substantially as claimed.

But Imahashi, Tanamura et al and Martin fail to teach that the first and second alignment mechanisms comprise a mask support member configured to support the mask, a substrate support member configured to support the substrate, an attachment fixture support member configured to support the attachment fixture, and a movement mechanism for changing relative positions between the mask support member, the substrate support member, and the attachment

fixture support member, whereby the mask and the substrate are aligned, attached, or separated.

However, Yamazaki et al teach that the first and second alignment mechanisms comprise a mask support member (207) (Fig 2A, 2B), configured to support the mask, a substrate support member (204) configured to support the substrate, an attachment fixture support member (electromagnetic field) configured to support the attachment fixture, and a movement mechanism (205a - conveyor rail) for changing relative positions between the mask support member, the substrate support member, and the attachment fixture support member for the purpose of aligning a mask and the substrate without warping (Page 2,3, Paragraph 0035).

Thus, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the apparatus of Imahashi, Tanamura et al and Martin so as to include an electromagnet, a mask support member and a mask support member, an an attachment fixture support member and a movement mechanism as taught by Yamazaki et al in order to prevent the substrate from warping when held by the alignment mechanism.

Also, Burrows et al teach that A shadow mask is positioned in a first position over a substrate. A first process is performed on the substrate through the shadow mask. After the first process is performed, the shadow mask is moved to a second position over the substrate, measured relative to the first position. After the shadow mask is moved to the second positon, a second process is performed on the substrate through the shadow mask and the mechanisms used to align the mask and the substrate are piezo electric materials and x-y translators may be used to achieve such movement. Measuring the second position relative to the first position advantageously avoids the effort and cost of performing a second alignment relative to features on the substrate. This invention may be used to deposit onto a substrate a number of layers having similar but not identical shapes and sizes from a direction approximately perpendicular to the substrate, with out changing the angle from which uniform deposition occurs (Abstract

and Col.3, Line 15-46) (Fig. 1-17).

Response to Arguments

Applicant's arguments filed 10/02/2007 have been fully considered. Applicant argued that " Tanamura fails to disclose a first formation unit and a second formation unit, each unit including a plurality of vacuum processing chambers. Indeed, each 'formation unit' in Tamamura (e.g., 22, 22a, 22b and 22c) only corresponds to or includes one processing chamber (e.g., 22)".

Applicants arguments are not persuasive because Tanamura is already showing a series of chambers and each one is connected in series through a gate valve so it is possible to remove or attach plurality of process chambers and alignment chambers in series. And first formation unit, second formation unit, third formation unit, first alignment chamber (mechanism), second alignment chamber, third alignment chamber are just mere duplication of parts.

Applicant argued that "Imahashi relates again to semiconductor wafers and does not disclose aligning or realigning a mask relative to a substrate, especially in a unit connecting a first formation unit to a second formation unit. That is, the interconnection unit U3b in Imahashi appears to be a transfer station, rather than an alignment unit for realigning a mask to a substrate for the formation of a second light emitting color".

Applicants arguments are not persuasive because Imahashi teaches the film formation unit with plurality of process chambers, alignment chambers (interconnection units) and in/out chambers (load lock and unload lock chambers). Further, (Fig. 8, Col.7, Line 2-9) in Imahashi teaches the interconnection units U3 and U7 not only functions to temporarily store the wafers W between the two transfer units U2, but can function to perform a test, temperature regulation, heat treatment, alignment, etc., so here the interconnection unit may be used for aligning, attaching or separating the substrate from the process chamber or formation chamber or aligning,

attaching or separating the mask and the substrate from the process chamber or formation chamber or positioning the substrate in the process chamber or formation chamber. So It is to perform designated function.

Applicant argued that "Yamazaki fails to disclose or suggest varying the thickness of the organic layers from one emitting color to another".

Applicant arguments are persuasive but Tanamura discloses varying of thickness of each layers from one emitting color to another.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent No: 6,132,280, U.S. Patent No: 6,776,880 B1 and U.S. Pub No: 2005/0005850 A1 discloses multiple chambers, U.S. Patent No: 5,259,881 discloses wafer processing cluster tool with alignment chamber, EP 1035576 A2 discloses a processing method of silicon epitaxial growth and a processing apparatus including an alignment chamber.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Viji N. Bernard whose telephone number is 571-272-6425. The examiner can normally be reached on Mon-Fri 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Viji Bernard
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